

## Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method comprising:

receiving content for transmission from a plurality of transmit antennae, wherein the received content is a vector of input symbols ( $s$ ) of size  $N_c \times 1$ , wherein  $N_c$  is the number of subcarriers of the multicarrier wireless communication channel; and

generating a rate-one, space-frequency code matrix from the received content for transmission via the plurality of transmit antennae by dividing the vector of input symbols into a number  $G$  of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number  $G$  of pre-coded vectors ( $v_g$ ), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of  $N_G$  subcarrier spacings.

- 2-3. (Canceled)

4. (Currently Amended) A method according to claim [[3]] 1, further comprising:

dividing each of the pre-coded vectors into a number of  $LM \times 1$  subvectors; and

creating an  $M \times M$  diagonal matrix  $D_{s_n,k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T s_g, \dots, \Theta_{M \times k}^T s_g\}$ , where  $k=1 \dots L$  from the subvectors.

5. (Original) A method according to claim 4, further comprising:  
interleaving the  $L$  submatrices from the  $G$  groups to generate an  $M \times Nc$  space-frequency matrix.

6. (Original) A method according to claim 5, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .

7. (Original) A method according to claim 1, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .

8. (Currently Amended) A physical storage medium having stored thereon ~~comprising~~ content which, when executed by an accessing processing communications device causes the processing communications device to cause a communications device ~~to~~ implement a method according to claim 1.

9. (Currently Amended) An apparatus comprising:

a diversity agent to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols ( $\mathbf{s}$ ) of size  $N_c \times 1$ , wherein  $N_c$  is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from a plurality of transmit antennae by dividing the vector of input symbols into a number  $G$  of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number  $G$  of pre-coded vectors ( $\mathbf{v}_g$ ), wherein successive symbols from the same group transmitted from the same antenna are at a frequency distance that is multiples of  $N_G$  subcarrier spacings.

10-11. (Canceled)

12. (Currently Amended) An apparatus according to claim [[11]] 10, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of  $LM \times I$  subvectors, and to create an  $M \times M$  diagonal matrix  $D_{\mathbf{s}_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T \mathbf{s}_g, \dots, \Theta_{M \times k}^T \mathbf{s}_g\}$ , where  $k=1 \dots L$  from the subvectors.

13. (Original) An apparatus according to claim 12, wherein the space-frequency encoding element interleaves the  $L$  submatrices from the  $G$  groups to generate an  $M \times Nc$  space-frequency matrix.

14. (Original) An apparatus according to claim 13, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .

15. (Original) An apparatus according to claim 9, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .

16. (Currently Amended) A system comprising:  
a number  $M$  of omnidirectional antennas; and  
a diversity agent, to receive content for transmission via a multicarrier wireless communication channel, wherein the received content is a vector of input symbols ( $s$ ) of size  $Nc \times 1$ , wherein  $Nc$  is the number of subcarriers of the multicarrier wireless communication channel, and to generate a rate-one, space-frequency code matrix from the received content for transmission on the multicarrier wireless communication channel from at least a subset of the  $M$  omnidirectional antennas by dividing the vector of input symbols into a number  $G$  of groups to generate subgroups and multiplying at least a subset of the subgroups by a constellation rotation precoder to produce a number  $G$  of pre-coded vectors ( $v_g$ ), wherein successive symbols from the same group transmitted

from the same antenna are at a frequency distance that is multiples of NG subcarrier spacings.

17-18. (Canceled)

19. (Currently Amended) A system according to claim [[18]] 16, the diversity agent further comprising:

a space-frequency encoding element, responsive to the pre-coder element, to divide each of the pre-coded vectors into a number of  $LM \times I$  subvectors, and to create an  $M \times M$  diagonal matrix  $D_{s_g, k} = \text{diag}\{\Theta_{M \times (k-1)+1}^T s_g, \dots, \Theta_{M \times k}^T s_g\}$ , where  $k=1 \dots L$  from the subvectors.

20. (Original) A system according to claim 19, wherein the space-frequency encoding element interleaves the  $L$  submatrices from the  $G$  groups to generate an  $M \times Nc$  space-frequency matrix.

21. (Original) A system according to claim 20, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .

22. (Original) A system according to claim 16, wherein the space-frequency matrix provides  $MNL$  channel diversity, while preserving a code rate of 1 for any number of transmit antenna(s)  $M$ , receive antenna(s)  $N$  and channel tap(s)  $L$ .